Curriculum Vitae

Name: Thomas J. Dillon, Jr.

Work Address: Southwest College, 10141 Cash Road, Houston, TX 77477

Office Telephone Number: 713-718-7770 (Math Department Secretary)

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Education:

- MEE Electrical Engineering, University of Houston, Houston, Texas, 1995.
- Graduate Studies Mathematics, Montana State University, Bozeman, Montana, 1980.
- BA cum laude Mathematics, Carroll College, Helena, Montana, 1979.

Teaching Experience:

Houston Community College System, Southwest College, Department of Mathematics
Adjunct Professor of Mathematics (2004 – 2013, 2018 – present)

Classes taught:
MATH 2413 – Calculus I
MATH 2412 – Pre-Calculus
MATH 1350 – Mathematics for Elementary Teachers I
MATH 1342 – Statistics
MATH 1325 – Elements of Calculus with Applications (Business Calculus)
MATH 1324 – Finite Math with Applications
MATH 1316 – Plane Trigonometry
MATH 1314 – College Algebra
MATH 0306 0308, 0312 – Fundamentals of Mathematics I & II, Intermediate Algebra

Highlights:

- Responsible for teaching Mathematics on four campuses of Houston Community College System.
- Successfully taught 44 courses to a total of 841 students over ten years.
- Earned a Quality Rating of 4.5 on Rate My Professors website. Tied for 2nd highest rating of those Professors of Mathematics at HCC with more than 125 ratings of their teaching.
- Taught eight developmental math courses to over 150 students.
- Delivered thirty-six college level mathematics courses to nearly 700 students.
- Worked to help 280 students be successful in 15 sections of College Algebra.
- Used a combination of in-class work, electronic homework, SMART Sympodium class notes posted to the HCCS learning web along with partial credit policy on hand graded tests.
- Returned all graded homework and test papers to the students for their practice and finals review.

University of Houston Clear Lake, SCE, Department of Computer Engineering
Guest Lecturer (2002, 2003); Adjunct Faculty (2005 – Present)

2018 Outstanding Adjunct Award at UHCL
Finalist for the 2010-2011 Piper Professor Award at UHCL.

Classes taught:
CENG 6431 DSP Implementations – Techniques for application of DSP on TI C6x processors
CENG 5431 Digital Signal Processing – Graduate DSP theory course
CENG 5931 Topics in Computer Engineering – Design with the TI MSP430 Microcontroller/IOT
CENG 5931 Topics in Computer Engineering – Geophysical Signal Processing
CENG 5131 Engineering Applications – Mathematical techniques for engineering problems
CENG 4135 Digital Signal Processing Applications – Undergrad implementations course
CENG 3135/3315 Introduction to Digital Signal Processing – Undergraduate DSP theory course
SENG 5231 Concurrent Engineering – Review of mathematics for Systems Engineering
SWEN 4232 Software Engineering – Introduction to Software Engineering
SWEN 5430 Software Metrics – Review of probability, statistics and applications to SW

Highlights:
- Responsible for teaching 49 courses to a total of 944 students over twelve years.
- Taught twenty courses in DSP Theory/Applications to 154 grad/70 undergrad students.
- Engineering Mathematics was reviewed and reinforced in sixteen courses for 424 students.
- Utilized MATLAB programming skills to enhance 40 courses with a total of 763 students.
- Reinforced engineering practice using Engineering Notebooks in 23 courses / 383 students.
- Designed classes with TI microprocessors resulting in numerous equipment donations for labs.
- Borrowed seismic instruments from Geometrics for three Geophysical Signal Processing courses where students designed surveys, collected seismic data, and learned how to process real data.

Rice University, Houston, Texas
Guest Lecturer (2002): Faculty and Graduate Student Workshop on TMS320C6000 DSP.

Montana State University, Department of Mathematical Science
Teaching Assistant (1979 - 1980)

Classes taught: Trigonometry, Business Calculus
Honor society induction: Pi Mu Epsilon

Consulting:

Digital Faculty Consultant for multiple engineering/mathematics textbooks, including:
Chapra Numerical Methods 7e (2014); Roberts Signals and Systems 3e (2016);
Hayt-Durbin Engineering Circuit Analysis 9e (2017); Rosen Discrete Mathematics 8e (2017)

Professional Memberships:

Senior Member IEEE (active)
Society of Exploration Geophysicists
IEEE Past Chairman - Galveston Bay Section (active)
IEEE Signal Processing Society (active)
IEEE Communications Society
Rice Alliance for Technology and Entrepreneurship

Professional Achievements:

JETS Software Excellence Team Award, 2017
NASA Group Achievement Award for ISS Cold Stowage Team, 2016
NASA Group Achievement Award for Cold Stowage Team, 2014
NASA Group Achievement Award for the Space Act Agreement Maker Team, 2007
IEEE Technical Conference Award, 2002
Society of Exploration Geophysicists Outstanding Presentation Award, 1986

Industry Activities:

Program Chairman of the Symposium for Space Applications of Wireless & RFID (SWIRF) 2007, Hobby Airport Hilton, Houston, Texas, May 8-9, 2007

Member of the Organizing Committee, 2004 International Symposium on Measurement, Control, and Robotics, NASA Johnson Space Center, Houston, Texas, September 16-18, 2004

Member of the Technical Committee, IEEE Region 5 Annual Technical Conference, Houston, Texas, April 19-21, 2002

Session Chairman, International Conference on Signal Processing & Technology, Toronto, Ontario, Canada, September 13-16, 1998

Publications and Presentations:

Dillon, T. J., "DSP Software Debugging Techniques", Presentation made at INNOVATION 2011 Workshop, NASA Gilruth, Houston, Texas, Oct 7, 2011

Dillon, T. J., "Performance Improvement in DSP Applications", Presentation made at INNOVATION 2010 Workshop, NASA Gilruth, Houston, Texas, Nov 12, 2010

Dillon, T.J., "Advanced Digital Signal Processing", Two-Hour Tutorial at the IEEE Region 5 Annual Technical Conference, Houston, Texas, April 19-21, 2002

Dillon, T.J., "G.723.1 Dual-Rate Speech Coder: Multichannel TMS320C62x Implementation", Texas Instruments Incorporated, Application Report SPRA552B, February 2000

Dillon, T.J., "DSP System Development with the TMS320C62x Evaluation Module", Half-Day Tutorial at the International Conference on Signal Processing & Technology, Toronto, Ontario, Canada, September 13-16, 1998

Dillon, T.J., "The Use of Software Pipelining in Developing DSP Algorithms for the TMS320C6x", Proceedings of the International Conference on Signal Processing & Technology, San Diego, California, September 1997

Dillon, T.J., "The VelociTI™ Architecture of the TMS320C6x", Proceedings of the International Conference on Signal Processing & Technology, San Diego, California, September 1997

Dillon, T.J.* and Robinson, S., "Method to Handle the Volume of Refracted Arrivals in 3-D Refraction Surveys", Expanded Abstracts – Society of Exploration Geophysicists, Fifty-eighth Annual International Meeting & Exposition, Anaheim, California, October 30-November 3, 1988 (* presenter)

Dillon, T.J.* and Robinson, S., "Quantitative Diagnostic Tools for 3-D Refraction Statics", Technical Programme and Abstracts – European Association of Exploration Geophysicists, Fiftieth Meeting and Exposition, The Hague, The Netherlands, June 6-10, 1988 (* presenter)

Chon, Y. and Dillon, T.J.*, "Tomographic Mapping of the Weathered Layer", Expanded Abstracts – Society of Exploration Geophysicists, Fifty-sixth Annual International Meeting & Exposition, Houston, Texas, November 2-6, 1986 (* presenter)

Work-related Experience:

SUMMARY: Customer oriented engineering professional with extensive experience in signal processing in the aerospace, semiconductor, computing and oil exploration businesses. A successful people/project manager who thrives on challenging opportunities that require broad technical expertise, individual and team development, and expanding technical expertise into new areas.

Jacobs Engineering, Inc., Houston, TX 2006 - present

PLSS Project Manager – Crew & Thermal Systems Division, JETS 2017-present

Engineering Project Manager responsible for management of technical, cost, schedule, and risk in testing Advanced Extra-Vehicular Activity (EVA) development technologies.

- Testing team provides design, analytical, and test engineering services in support of development and testing of the Portable Life Support Subsystem (PLSS) of the advanced EVA spacesuit.
- Building test rigs for the evaluation of pneumo-hydraulic and electrical components that will be designed into the next generation spacesuit to be used on ISS and ultimately the moon and Mars missions of the future.

Cold Stowage Lab Manager – Crew & Thermal Systems Division, JETS 2014-2017

Cold Stowage Systems Laboratory Manager responsible for operation and maintenance of the lab facility that supports the thermal carrier equipment for the International Space Station at Johnson Space Center.

- Responsible for the facility operations, safety, maintenance, calibration of laboratory equipment, including POLAR, GLACIER, Double Cold Bags and MELFI thermal engineering flight hardware as well as numerous ultra-low temperature freezers, a thermotron chamber, portable freezers, battery systems, Data Acquisition systems (DAQs) valued at approximately $6M in total.
- Project manager for a number of small software projects developed for the Cold Stowage team operations, including the requirement and testing phases for the Orbit database for Cold Stowage Forms to facilitate science payload transportation to ISS and the electronic Task Performance Sheet web and mobile platforms for iOS and Windows.
- Designed, built and tested several LiFEPO4 battery interface boxes and cables for powering flight and non-flight hardware during launch and landing operations for thermal management of science payloads sent to and returned from space.

Embedded Software Engineer – Robotics Engineering Division, ESCG/JETS 2012-2014

Senior Engineering Specialist responsible for design and testing of software for several battery management systems, while using Eclipse development tools and Git / Source Tree CM tools.

- Designed the software architecture and the TMS570 microcontroller C code for a battery management system used to ensure the safe operation of the R2 Robonaut battery pack.
- Wrote multiple libraries of functions to configure and capture critical data from several I2C enabled devices, such as the MAX127 and MAX1238 ADCs, the MAXDS1307 Real Time Clock and the MAX11068 battery management device.
- Completed the design, testing and delivery of a prototype PLSS battery. Data sampling and conversion of Li-Ion battery cell voltages, temperatures, currents and load voltages were captured to monitor the status of the battery.
- Designed numerous support tools, such as a unit testing tool, a battery packet generator to simulate a battery for GUI development, LabVIEW interface to display status data.

Lead Project Manager – Structures Engineering Division, ESCG 2009-2011

Engineering Project Manager responsible for management of technical, cost, schedule, and risk for multiple delivery orders within the Structures Engineering Division.

- Responsible for project status reporting, risk analysis and financial performance of Mechanical Engineering Services such as Thermal Design, Loads and Structural Dynamics, Manufacturing, Mechanical Design and Analysis. (Approximately 30 sub tasks totaling nearly $4.5M)
- Negotiate modification of delivery order technical and financial requirements with Project Directives, and Delivery Order modifications using the RFP and Proposal methodology.

Section Manager – Avionics Systems Development, ESCG 2008-2009

Engineering Specialist assigned to Avionics Systems Division (Bldg 44) at Johnson Space Center.

- Section Manager of the Avionics Systems Development team, which provides hardware development and sustaining engineering support of avionics flight hardware such as Cameras, Laptops, Space to Space Communications System, Radiation Instrumentation, Integrated Sensor Inspection System, GPS Antennas, ISS/CEV Communications Adapter, and CEV Avionics.
- Project manager of the Electrical, Electronic, and Electromechanical (EEE) Parts contractor team, providing electronic parts analyses, radiation test planning, processing and analyses for parts used in Space Shuttle, Payloads and Crew Exploration Vehicle (CEV) projects.
- Responsible for technical oversight of the work accomplished processing spaceflight hardware. Provide guidance and mentorship for project managers, project engineers and support staff.

Section Manager - Mission Support and Tech Transfer, ESCG 2006-2007

Engineering Specialist assigned to the Advanced Planning Office (Bldg 45) at Johnson Space Center.

- Responsible for project management of the Technology Transfer Office (TTO) contractor team, providing engineering and administrative support of Partnerships, IP Disclosure and Licensing, and the Small Business Innovation Research and Small Business Technology Transfer Programs.
- Section Manager responsible for people management of the TTO and the Mission Evaluation Room (MER) Support Team, which provides software development and support of the ISS MER operations and Shuttle MER operations at the Mission Control Center (Bldg 30).
- Responsible for writing, negotiating and processing of Space Act Agreements between NASA and external organizations. Supporting the NASA exploration mission with research collaborations in the engineering, science and biotech related technologies critical for human spaceflight.

Jacobs-Sverdrup/Hernandez Engineering, Inc., Houston, TX 2004-2005

Engineering Specialist I, SEAT Contract/ESCG 2004-2005

Design Engineering work in the Avionics Systems Division (Bldg 44) of the Engineering Directorate at Johnson Space Center. Project tasks included design of hardware, parts selection, hardware debug and development of software modules.

- Project engineer in the Return-to-Flight effort responsible for TPSs, DRs, TRRs and Test Plans during the certification of the LIB battery in the 8FT, 11FT, ETA, SSATA chambers, as well as the EMI testing and astronaut familiarity training sessions prior to Expedition 13 and STS 121.
- Designed prototype hardware to replace cables for the ATU on the ISS, using Bluetooth™ RF modules, and interfaces for debug/field upgrade using serial, parallel and USB interfaces.

- Software architect for real-time video system software of the Miniature Autonomous Extravehicular Robotic Camera (MiniAERCam). Responsible for the successful radiation testing of the DSP and Ethernet chips for this project at the University of Indiana Cyclotron.

Texas Instruments, Inc., Stafford, TX 1996-2004

DSP Customer Support Manager, ASP Products, SC Group 2003-2004

Managed the Catalog DSP Hotline. Responsible for hiring, training and motivating direct reports and negotiating process improvements from internal TI applications and support organizations.

- Measured and reported trends in customer cases, such as software module categories or on-chip hardware peripherals. Successfully prioritized efforts and reduced the number of customer calls.
- Improved the performance of the first and second level support teams by creating a support rotation program with the Hotline to learn from the experts, which reduced call volume by 33%.

C6000 Development Systems Manager, ASP Products, SC Group 1999-2002

Responsible for project management of hardware and software development tools for the C6000 DSP product line. Negotiated specifications, resources and schedules.

- Managed the development of the Imaging Developer's Kit, a "Best in Class" out-of-the-box experience for customers and a demonstration platform for a number of software technologies.
- Responsible for delivering the C6x Evaluation Module (EVM). Sales of this product eclipsed the previous offering 30:1, resulting in $15 million revenue and over $100 million design-in LNR.

Senior DSP Applications Engineer, ASP Products, SC Group 1996-1999

Member of the applications engineering team for a family of fixed-point and floating point DSPs. Tasks included algorithm benchmarking, technical presentations, documentation and Hotline support.

- Designed and tested Host and Target software for the C6211/6711 DSP Starter Kits, including the Power-On-Self-Test, Confidence Test, Target Loader, Flash Programmer and Manufacturing Test.
- Created the original workshop modules on code optimization as well as material on the Very Long Instruction Word (VLIW) pipeline and interrupts for the TMS320C6x CPU and Instruction Set Reference Guide.
- Wrote the first two key papers on the new VLIW DSP, one on the architecture of the device and one on the software pipelining concept used to achieve high performance algorithms on the DSP.
- Developed the Multimedia Technical web presence for the successful launch of the C6x DSP product family. The processor demonstration was a big hit in explaining the VLIW operation.

Hewlett-Packard (formerly Compaq), Houston, TX 1994-1996

Design Engineer, Graphics and Multimedia Group

Responsible for the design of a number of hardware projects in the commercial desktop division.

- COG engineer for a motherboard and option card PCI graphics solution. Tasks included writing specifications, evaluating vendors, hardware and software debug, and FCC tests.
- Designed a Sound Blaster Pro™ audio back-end for a video conferencing/sound card for high-end business desktop PCs, which was delivered as a production product by PictureTel.
- Created a polygon decomposition algorithm for testing the polygon fill engine of the QVision™ graphics accelerator ASIC.
- Represented Compaq as Technical Liaison to the Personal Conferencing Specification Work Group that proposed a video conferencing specification for the PC desktop. Advised the corporation not to adopt the specification for our products based on deficiencies in the proposed transform mathematics and saved the corporation significant time and money.

Halliburton Geophysical, Houston, TX 1984-1993

Product Development Engineer, Geophysical Products Group

Worked on a variety of technical tasks in research and development, design engineering and technical marketing.

- Directed the marketing effort for seismic exploration and processing products including the introduction of a 24-bit seismic system. This resulted in a major contract for equipment and services (approx. $100 million).
- Designed a VME form-factor correlator interface board for a seismic system, which was produced for internal use by company crews and a number of oil exploration companies.
- Investigated the properties of a very low distortion test signal, including filtering and FFT windows on data resolution. Evaluated algorithmic concepts, provided test data and wrote functional specifications for the 24-bit test signal generator. This effort supported a successful patent application for the corporation.
- Supported the training department by delivering numerous subject matter expert talks on 3D acquisition and processing techniques to international customers.

Research Geophysicist, Geophysical Research Department

Technical advisor to data processing group and project manager for 3D land seismic acquisition planning software.

- Managed a project to develop a package of programs for 3D land seismic acquisition planning, including the design, development, testing and documentation for the product. Responsible for the training of several teams of users in the US, as well as Venezuela, Bolivia, Peru and Ecuador.

- Researched new techniques for 3D refraction statics to solve the near-surface weathering problem. Developed several novel techniques that were applied to domestic and international data sets. Presented the results to the Shell Chief Geophysicists School in The Hague as well as the international geophysical community through several of the SEG and EAEG conferences.

Shell Oil Company, Houston, TX 1980-1984

Exploration Geophysicist, Rocky Mountain Division
Actively involved in all phases of the acquisition and processing of multichannel seismic data including the planning, completion, processing and analysis of experiments and production seismic lines.

- Learned all the tasks in field operations with the survey crew, the shot hole drillers, the jug hustlers and the recording truck personnel. Participated in daily safety briefings and worked in each crew position to better understand the process and any documentation provided with the field data.
- Processed numerous 2D seismic surveys in the Rocky Mountain region, including data acquired by a company crew operating in the Williston Basin (eastern Montana and western North Dakota).
- Supported seismic data acquisition operations by a shear-wave crew imaging below the Columbia basalt near Yakima, Washington.
- Responsible for seismic acquisition field operations with contractor crews in Albuquerque, New Mexico and the Four Corners area of Utah.
- Worked with a helicopter shot hole drilling crew in the Badlands of North Dakota to drill shot holes that could not be obtained by conventional means.
- Worked in the field operations and processing team of the first 3D land survey, which used four company seismic crews in south Texas. Responsible for acquiring and processing the 2D data which was subsequently turned over to the 3D research group.
- Completed Shell basic training for geophysicists. Attended advanced courses – Physics of Seismology, Seismic Field Methods, Field Geology, Seismic Interpretation. Attended periodic Theory and Application seminars in seismic processing topics including Refraction and Reflection Statics, Deconvolution, Velocity Analysis, and Migration Techniques.

HCC Course Details:

MATH 0306 - Fundamentals of Math 1 - Topics include fundamental operations in whole numbers, fractions and decimals, percent's, ratios, and proportion, descriptive statistics, and an introduction to the real numbers.

MATH 0308 - Fundamentals of Math 2 - Topics include real numbers, basic geometry, polynomials, factoring, linear equations, and inequalities quadratic equations, and rational expressions.

MATH 0312 – Intermediate Algebra - Topics include factoring techniques, radicals, algebraic fractions, complex numbers, graphing linear equations and inequalities, quadratic equations, system of equations, graphing quadratic equations, and an introduction to functions.

MATH 1314 – College Algebra - Topics include quadratics, polynomial, rational, logarithmic and exponential functions, system of equations, progression, sequences and series, matrices and determinants.

MATH 1316 – Plane Trigonometry - Topics include solutions of triangles, Euler identity, graphing of trigonometric and inverse trigonometric functions, identities, trigonometric equations and an introduction to vector analysis.

MATH 1324 – Finite Math with Applications - A survey of finite mathematics and its application to problems of business and the natural and social sciences. Topics include set theory, probability, an introduction to matrices, linear programming, and an introduction to statistics.

MATH 1325 – Elements of Calculus with Applications - A survey of differential and integral calculus including the study of functions and graphs from a calculus viewpoint as applied to problems in business and the natural and social sciences.

MATH 1342 – Statistics - Topics include histograms, probability, binomial and normal distributions and their applications, correlation and prediction, and tests of statistical hypotheses.

MATH 1350 – Math for Elementary Teachers 1 - Concepts of sets, functions, numeration systems, number theory, and properties of the natural numbers, integers, rational, and real numbers systems with an emphasis on problem-solving and critical thinking.

MATH 2412 – Pre-Calculus - Topics include elementary theory of functions and equations, analytic geometry, vectors, introductory logic, mathematical induction, sequences and finite series.

MATH 2413 – Calculus I - An integrated study of differential calculus with analytic geometry including the study of functions, limits, continuity, differentiation, and an introduction to integration.

UHCL Course Details:

CENG 3315/3135: Introduction to Digital Signal Processing - Sinusoids, spectrum representation, sampling and aliasing, FIR and IIR digital filters. Laboratory instruction. (Prerequisite: Calculus I, II and C Programming.)

CENG 4135: Digital Signal Processing Applications - Fundamental concepts in Digital Signal Processing applications with algorithmic implementations using LabVIEW, Texas Instruments DSPs, and Code Composer Studio IDE. (Prerequisite: CENG 3135/3115:)

SWEN 4342: Software Engineering - Introduction to Software Engineering. Major phases of the software life cycle are introduced from requirements through maintenance.
(Prerequisites: A course in programming in a high-level language, Data Structures recommended.)

CENG 5131: Engineering Applications - Study of modern engineering techniques emphasizing mathematical methods currently used in industry. The MATLAB software package will be used for problem solving. (Prerequisite: Linear Systems Analysis or equivalent.)

CENG 5431: Digital Signal Processing - Sampling, Fourier analysis, FFT's and digital filtering. Laboratory instruction. (Prerequisite: CENG 5131 or equivalent.)

CENG 5931: Topics in Computer Engineering (TI MSP430 microcontroller) architecture and peripherals, reinforce C+ASM coding skills, use laboratory notebooks, schematics, Gerbers, hardware tools, prepare technical presentations.

CENG 5931: Topics in Computer Engineering (Geophysical Signal Processing) learn acquisition of seismic data and processing techniques; recognize noise; use digital signal processing concepts applied to multichannel digital data used in the oil industry.

CENG 5931: Topics in Computer Engineering (Internet of Things) concepts of IOT an emerging topic with application to Smart Cities, automotive ADAS, low power sensors deployed in many scenarios; fundamentals of microcontroller hardware and software development to provide a platform for creation of numerous IOT applications.

CENG 6431: DSP Implementations - Implementation techniques of digital signal processing applications emphasizing Code Composer Studio and the TI DSP 320 family of digital signal processors. Laboratory instruction. (Prerequisite: CENG 5431 and C Programming.)

SENG 5231: Concurrent Engineering - Determining needs and organizing teams from the multiple disciplines required for integrated system and product development. Technical and management issues and methods of involving end users, suppliers, service providers and engineering specialists to work with the SENG team on concurrent activities throughout the system's life cycle.

SWEN 5430: Software Metrics - Theory, application and techniques of measurement and analysis. Process and product metrics. (Prerequisite: SWEN 4342. MATH 3334 recommended.)